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# **SAMPLING AND ANALYSIS PLAN**

## SAMPLING AND ANALYSIS PLAN

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Site Layout

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### **Appendix 1**

Health And Safety Plan

# 1. INTRODUCTION

Ramboll Environ US Corporation (Ramboll Environ) has prepared this Sampling and Analysis Plan (SAP) for surface water and potential surface soil sampling following the fire event which occurred on June 8, 2015 at the Miller Chemical & Fertilizer, LLC facility located at 120 Radio Road in Hanover, Pennsylvania (the "site") (Figure 1). This SAP was prepared as instructed by PADEP to fulfill PADEP's requirements for data enabling the Department to allow resumption of municipal drinking water extraction from local water bodies. The SAP provides details regarding the methods and procedures that will be used to collect and analyze samples from the site and nearby water bodies.

## 2. SITE SETTING AND HISTORY

### 2.1 Site Setting

Miller Chemical & Fertilizer Corporation, LLC (Miller) owns and operated a fertilizer formulation and blending facility located at 120 Radio Road in Hanover, Adams County, Pennsylvania. The site was initially developed for fertilizer manufacturing in the late 1930s or early 1940s and operations expanded in the 1960s to include pesticide formulation and blending. The approximately 13.23-acre site is located 50 miles northwest of Baltimore. The site was developed with an approximately 96,000-square foot main building, which was located in the center of the property. The single story building housed production, storage, laboratory, packaging, and office operations. Other smaller structures on the site consisted of an approximately 6,300-square foot office building, a 2,640-square foot maintenance building, and a 1,056-square foot former break room building, which was used for document storage. The areas surrounding the former buildings are landscaped with grass and other vegetation. A storm water retention pond is located northeast of the main building.

### 2.2 Site History

Based on Ramboll Environ's review of historical sources of information and discussions with facility personnel, the site was agricultural land until being developed in the late-1930s or early 1940s for fertilizer manufacturing activities by Union Fertilizer. The operations appear to have been conducted in an original building in the northwestern portion of the site and were supported by the maintenance building and the break room building. In the mid-1940s, the facility was acquired by Miller and operations continued in the original building until the mid- 1980s, when this structure was demolished in place and the debris was disposed of with a controlled burn.

Portions of the current manufacturing building were originally constructed in the early 1960s for the blending of pesticides. Initially, organochlorine pesticides were formulated using primarily xylenes, emulsifiers, and the pesticide compound received from the chemical manufacturer. As these compounds became more regulated, the facility began blending organophosphate pesticides (e.g. parathion) and carbamates (e.g., Sevin). The pesticide formulation operations were phased out by the late-1990s. By the early 1990s, the facility began shifting operations to fertilizer blending, and pesticide handling was limited to repackaging.

The building underwent many additions from approximately 1984 until 2012. The office building was constructed sometime between 1968 and 1971.

At approximately 3:40 am on Monday, June 8, emergency responders were alerted of a fire at the Miller facility. No one was inside the building at the time and no injuries occurred while fighting the fire. Firefighters applied a large quantity of water to extinguish the fire. In addition, a heavy rainfall followed. Despite efforts to contain firefighting water and rainwater in a retention pond at the site, runoff from firefighting activities traveled across farm fields towards Slagle Run, a creek north of the facility that flows west. Slagle Run discharges to the South Branch of Conewago Creek, which flows north.

## 3. SAMPLE COLLECTION

### 3.1 Scope of Work

In order to evaluate potential impacts to surface water and surface soil as a result of the firefighting activities, and to allow authorities to make the determination of when to resume municipal drinking water supplies, Ramboll Environ prepared this plan for the following sample collection at the site. Sampling parameters and approximate locations were provided in discussions with personnel from Pennsylvania Department of Environmental Protection.

- Surface Water: Ramboll Environ will collect up to eight surface water samples daily for the laboratory analysis of total organic carbon (TOC), total nitrogen, total phosphorous, sulfates, and a project specific list of metals<sup>1</sup>. In addition, on the first day of sampling at each location, Ramboll Environ will also collect eight surface water samples for the laboratory analysis of nitrate, nitrite, orthophosphate, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), organochlorine pesticides, organophosphorus pesticides, and herbicides. Based on the results from these samples, additional samples for these analytes may be collected as needed. Ramboll Environ will conduct sampling for up to two weeks.
- Surface Soil: Ramboll Environ may collect up to three samples from visibly impacted soil located on the facility and/or the farm land located north of the facility for the analysis of VOCs, SVOCs, project specific list of metals<sup>1</sup>, nitrate, nitrite, and total phosphorous. Additional surface soil samples may be collected depending on field conditions.

### 3.2 Surface Water Collection

In detail, Ramboll Environ will collect up to three samples from Slagle Creek, up to three samples from the South Branch of Conewago Creek, up to two samples from the main branch of Conewago Creek, and up to one sample from containerized water located at the facility (see Figure 2 for approximate locations of stream samples). Of the three samples in Slagle Creek, one sample will be located upstream of the points where fire runoff entered the creek, one sample will be located downstream of the points where runoff entered the creek, and one sample will be collected near the Hanover water intake. Of the three samples to be collected on the South Branch of Conewago Creek, one sample will be collected upstream from where Slagle Creek meets the South Branch, one sample will be collected downstream of that point, and one sample will be collected near the New Oxford Municipal Authority water intake. Of the two samples to be collected in Conewago Creek, one sample will be collected upstream from where the South Branch meets the main branch of Conewago Creek, and the other sample will be collected downstream of that point.

Surface water will be collected using a peristaltic pump and disposable polyethylene and silicon tubing. All surface water samples will be collected into laboratory-supplied sample containers with appropriate preservative, labeled, packaged on ice, and delivered under standard chain-of-custody procedures to Phase Separation Science for the following analyses:

*On Friday, June 12, 2015 the following samples will be collected from the eight sample locations:*

- Total organic carbon (TOC) by Standard Method (SM) 5310C;
- Total nitrogen by SM 4500-NH3 C-1997;
- Total phosphorous by SM 4500-P-BE;

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<sup>1</sup> The laboratory will analyze for the following metals: aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, and zinc.

- Sulfates by USEPA method 300.0;
- Project specific list of metals that includes aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, and zinc by USEPA method 6020; surface water samples will be field filtered using a QED QuickFilter Inline 0.45-micron filter.

*On Sunday, June 14, if the water in the Creek is running clear, the sampling will be repeated. In addition to the analyses listed above, the samples will also be analyzed for the analytes listed below. If the water is not running clear, samples shall be collected when the water is observed running clear.*

- Nitrate by United States Environmental Protection Agency (USEPA) method 300.0;
- Nitrite by USEPA method 300.0;
- Orthophosphate by SM 4500-P-BE;
- VOCs by USEPA method 8260B;
- SVOCs by USEPA method 8270C;
- Organochlorine pesticides by USEPA method 8081B;
- Organophosphorus pesticides by USEPA method 8141B; and
- Herbicides by USEPA method 8151A.

In addition to the samples for laboratory analysis, surface water monitoring will also be conducted using a Horiba U-52 unit. The unit will either be placed directly in the water or a flow-through cell will be used if access to the stream is constrained. Prior to conducting surface water monitoring, the Horiba unit will be calibrated following the manufacturer's guidance. All calibration results will be documented in a field notebook. The following water quality parameters shall be recorded:

- Temperature (degrees Fahrenheit [°F]);
- Conductivity (millisiemens/centimeter [mS/cm]);
- pH (Standard Units);
- Oxidation Reduction Potential (millivolts [mV]);
- Turbidity (Nephelometric Turbidity Unit [NTU]); and
- Dissolved Oxygen (milligrams/liter [mg/L]).

Sampling may be repeated after Sunday, June 14 depending on results and discussions with Pennsylvania Department of Environmental Protection.

### **3.3 Surface Soil Sampling**

Up to three surface soil samples may be collected from the upper six inches of visibly impacted soil from the facility and/or the farm land located north of the facility. Surface soil samples will be grab samples and will be collected using stainless steel tools. Should field conditions warrant the collection of additional surface soil samples, Ramboll Environ will be prepared to collect additional surface soil samples. The location of each surface soil sample will be documented in the field notebook.

All surface soil samples will be collected into laboratory-supplied sample containers with appropriate preservative, labeled, packaged on ice, and delivered under standard chain-of-custody procedures to Phase Separation Science for the following analysis:

- Total nitrogen by SM 4500-NH3 C-1997;
- Nitrate by USEPA method 300.0;
- Nitrite by USEPA method 300.0;
- Total phosphorous by appropriate method;
- VOCs by USEPA method 8260;
- SVOCs by USEPA method 8270; and
- Project specific list of metals that includes aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, and zinc by USEPA method 6010B.

## 4. QUALITY ASSURANCE/QUALITY CONTROL

### 4.1 Sampling Procedures

Field equipment (e.g., PID and Horiba) will be calibrated prior to the beginning of each field day per manufacturer's recommendations. Chain-of-custody documents and field log books will be maintained for all samples. To evaluate the repeatability of the sampling procedures, at least one duplicate sample for each media will be collected daily (e.g., surface water and surface soil) for laboratory analysis. If surface soil samples are collected, the effectiveness of decontamination will be evaluated by collecting an equipment rinsate blank. Following decontamination of a stainless steel tool, deionized water will be poured over the tool into a container provided by the laboratory. The rinsate water will be submitted to the laboratory for the analysis of metals as defined above by USEPA method 6020. In addition, a trip blank will be submitted to the laboratory for the analysis of VOCs by USEPA method 8260 with each shipment of samples to the laboratory.

### 4.2 Sample Nomenclature and Labeling

Each sample will be assigned a unique identification (ID) code to facilitate sample tracking and management. Surface water samples will be labeled as follows:

MC-SW-xxx-YYMMDD

Where:

X = A unique code for each sampling location, as follows,

USC: Upstream Slagle Creek

DSC: Downstream Slagle Creek

HWI: Hannover Water Intake

USB: Upstream South Branch

DSB: Downstream South Branch

NOI: New Oxford Intake

UCC: Upstream Conewago Creek

DCC: Downstream Conewago Creek

YYMMDD = The date of the sample collection

In addition to the unique ID number, each sample container will be labeled with the following information:

- Date of sample collection;
- Time of sample collection;
- Initials of field sampler;
- Analyses to be conducted; and
- Preservative, if any.

#### **4.3 Documentation**

The activities conducted as part of this sampling program will be documented by field personnel in logbooks and supplemented by photographs as appropriate. Information recorded in the logbooks will include, at a minimum, the following:

- Name of person keeping the log and field personnel at the site;
- Location and name of the site;
- Time of arrival and departure from the site;
- Date and time of all logbook entries;
- Daily weather conditions and observations;
- Site conditions;
- Any field instrument calibration information;
- Location of sampling points;
- Sample collection information, including
  - Date and time of collection;
  - Sample matrix and physical description;
  - Sample identification number;
  - Method of collection;
  - Number and volume of containers collected;
  - Analyses for which sample is submitted; and
  - Identity of split or duplicate samples; and
- Additional relevant field observations.

#### **4.4 Data Management Procedures**

Electronic data deliverables will be available in electronic data deliverable (EDD) and PDF formats. Field logbooks, chain-of-custody forms, and data reports will be reviewed for consistency. Any deviations will be evaluated for their impact on data quality. Data validation will be performed in accordance with procedures described in USEPA's Guidance on Environmental Data Verification and Data Validation (USEPA 2002).

## **5. INVESTIGATION-DERIVED WASTE (IDW) AND DECONTAMINATION PROCEDURES**

Non-disposable field equipment, such as stainless steel tools, water quality meters, etc., will be decontaminated between samples or sample locations using a non-phosphate detergent wash



followed by a tap water rinse and a subsequent distilled water rinse. Water generated during decontamination procedures will be containerized and disposed of into Frac tanks located at the facility.

Personal protective equipment (PPE) for the site activities includes disposable gloves, safety glasses, steel-toe boots, high visibility vests, and hard hats. Gloves and disposable field equipment, such as polyethylene tubing, will be containerized and returned to the Miller site, where it will be labeled and staged for off-site disposal in accordance with applicable waste management regulations. Non-disposable PPE will be cleaned at the end of each day by removing visible dirt, and wiping with a damp cloth, as necessary

## **6. SAMPLE ANALYSIS**

Samples will be analyzed by a Pennsylvania-certified laboratory in accordance with the methods listed in Sections 3.2 and 3.3. Laboratory QA/QC procedures will be employed to ensure appropriate sample handling and analysis and to aid in the review and validation of the analytical data. QA/QC procedures include regular equipment maintenance; equipment calibrations; and adherence to specific sample custody and data management procedures. Samples will be analyzed in conjunction with appropriate blanks, laboratory duplicates, continuing calibration standards, surrogate standards, and matrix spiking standards in accordance with approved methodologies to monitor both instrument and analyst performance. Reporting limits for each analyte will be as low as reasonably achievable and below appropriate surface water quality criteria and soil cleanup criteria.

Laboratory deliverables will include laboratory data reporting sheets for each analysis, including blanks, surrogate standards, and matrix spiking standards. Also included with the deliverable will be a notation explaining the nature of any discrepancies, a copy of the chain-of-custody, and a certificate of analysis. Laboratory results will be provided in both electronic data deliverable (EDD) and PDF formats.

A twenty-four hour turn-around time is anticipated for initial laboratory analytical results.

## **7. HEALTH AND SAFETY**

A Health and Safety Plan (HASP) has been prepared that covers the sample collection activities described in this Work Plan. The HASP, which is included in Appendix 1, informs field personnel of known or reasonably anticipated potential hazards and safety concerns at the site. Field personnel will review and sign the HASP prior to commencing on-site activities.

## **8. REFERENCES**

USEPA. 2002. Guidance on environmental data verification and data validation, EPA QA/G8. EPA/240/R-02/004. Office of Environmental Information. November.  
<http://www.epa.gov/QUALITY/qs-docs/g8-final.pdf>

**FIGURE 1**  
**SITE LAYOUT**

**FIGURE 2**  
**APPROXIMATE SAMPLE LOCATIONS**

**APPENDIX 1**  
**HEALTH AND SAFETY PLAN**